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A Kenya nest and behavioural notes on the Green-headed Sunbird *Cyanomitra (Nectarinia) verticalis*

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The Green-headed Sunbird *Cyanomitra (Nectarinia) verticalis* is a reasonably well known (see citations in Fry *et al.* 2000 and Cheke *et al.* 2001) sunbird of diverse elevations in its extensive Afrotropical range. Small numbers of the eastern race *viridispiciens* are resident and a pair and their young are regular attendants at 5-7 sugar-water feeders at our 8 ha property, maintained as a wildlife refuge northeast of Nanyuki at 1,950 m, Kenya (0°2'N, 37°14'E). The habitat here is mixed with upland forest adjacent to the Nanyuki River, bordered to the east by dense thickets and secondary woodland, and still further east and slightly higher, a mixture of degraded *Acacia drepanolobium* grassland and patches of degraded dry *Juniperus-Olea-Euclea* woodland and bushland. At least one pair of Green-headed Sunbirds nested in January-February 2001; recent fledglings were seen mid-July into August 2001; an adult male accompanied two recent fledglings (with gape wattles) to the feeders in mid-January 2002, and another fledgling with male and female was there October-November 2002. Rainfall, usually tri-seasonal about Nanyuki (Brown & Britton 1980), was above average for the area in both years, and exceptional in January 2001, and very heavy in October-November of 2001 and 2002; rainfall for 2001 was 987 mm at the house, while the Nanyuki yearly mean is 688 mm, and the 5 years 1997-2001 saw extremes of 398 mm in 2000 and 1,597 mm in 1997). Like most birds of this region the Green-headed Sunbird breeds during and just after the rains when insects and nectar are available.

Ecology and behaviour

In our area this sunbird appears to be territorial and resident. We once observed two males near our feeders but one was chased away immediately. On their approach to the feeders they occasionally hawked insects. Sunbirds came from woods below the

house to inside and outside two verandas, rarely passing en route to feed at nearby flowering *Aloe* sp. and *Leonotis* sp. or to take insects. (The house is in open woodland and thickets, with thickets near bird feeders, scattered trees and various small-garden flowering plants, many known to be utilised by sunbirds). Most sightings of Green-headed Sunbirds away from feeders were in the riverine woodland, including forest and secondary growth, adjacent clearings, paths and a 0.2 ha vegetable garden, in which 12 banana *Musa acuminata* trees especially attracted them. They fed on nectar of banana flowers and upon insects attracted to the flowers and fruits. All nectar-foraging was direct, from the front of the flowers (Dowsett-Lemaire 1989, 1990), but they were difficult to observe in forest, as they were usually silent and foraged out of sight in the understorey and canopy vegetation. Members of a pair frequently foraged together, including at the nectar-feeders. About feeders the Green-headed was dominant over the regular attendant sunbirds (Scarlet-chested *Chalcomitra* (*Nectarinia*) *senegalensis*, Amethyst *C. amethystina*, Tacazze *Nectarinia tacazze*, an individual female Bronze *N. kilimensis*, and Variable *Cinnyris* (*Nectarinia*) *venusta*), apart from fully-plumaged adult male Tacazze, a few female Tacazze and most female Bronze sunbirds.

At the feeders behaviour differed from that of the other sunbirds. The Green-headed Sunbird was more placid and did not beat its wings and hop about the feeders with its body horizontal. Rather, when other sunbirds were at the feeder, it landed in an upright pose, head nearly vertical, appearing as if held upward by its bill; the head and throat feathers were smoothed and the bill maintained at 40°- 80° above the horizontal. The male also spread feathers of the sides of the neck, nape and upper back, which appeared laterally ruffled and shaggy. The female, lacking the iridescent throat colour, employed a less vertical posture during encounters, from which it was usually quicker to flee than was the male. From its bill-up position the male faced off against any prospective aggressor, poised to direct a strong forward and downward thrust with its bill at any overt aggression toward it. Indeed, the male Green-headed Sunbird often simply held its upright posture and maintained its position at the feeder as other sunbirds flew about it chasing one another, or attempted to supplant the Green-headed Sunbird. The hundreds of these displays seen over 5 years were of interspecific encounters; aggressive intraspecific behaviour may differ. Brosset & Erard (1986) described very different aggressive displays, with numerous males of a different race (either the nominate race or *C.v. bohndorffi*) defending sections of a flowering tree in Gabon, with males raising the tail and pointing the bill at an opponent, pectoral tufts flared. It would be rewarding to determine the frequency of occurrence of the "head-up" posture in these other races. It is certainly characteristic of the Nanyuki Green-headed Sunbirds, and often allows a male to hold its place and feed, even amid the turmoil involving interactions among 12 to 15 sunbirds of several species all about it. Noteworthy are the facts that we rarely glimpsed the edge of a male's pectoral tuft and the tufts were not used in displays.

Male Green-headed Sunbirds often accompanied their recent fledglings in visits to the feeder, and under such circumstances became feeder tyrants, attacking and

driving away any sunbird approaching the feeder occupied by the male and one or two of its young. The female sometimes accompanied one young to the feeders, but attempted to defend only a feeding site at one feeder (the nectar-feeders have one to six feeding holes or sites). Immature Green-headed Sunbirds coming on their own to the feeders (at about 2 weeks post-fledging) did not display, but seized a feeding site and commenced feeding. A feeding youngster might poke its bill at any sunbird pressing it. Indeed these immatures were able to hold their own against Amethyst, Variable and some Scarlet-chested Sunbirds, but gave way to some adult and aggressive, newly-fledged young Scarlet-chested Sunbirds, as well as to all Tacazze and Bronze Sunbirds.

The song of this race was discussed by Cheke *et al.* (2001; see also Zimmerman *et al.* 1996). As adults arrive at a nectar-feeder they utter a “t’chew-ee, t’chew-ee”, softer than similar calls of the Bronze Sunbird, and harsher; usually they are not repeated in series beyond 2 such single or double notes. Immatures call “cha-wi, cha-wi” in the same circumstances. Another aggressive call is a sharp “chep-pee-pee-pee-pee-pee” that may go into a song-like trill “-tee-tee-tee-”. In giving the “head-up” display posture males simultaneously call “peeeee-tew”, rising in pitch, then falling on the “-tew”. These do not precisely match calls described in the literature (see Fry *et al.* 2000, Cheke *et al.* 2001).

Nest and immatures

A nest was discovered by Stephen Njagi in early February 2001; adults were feeding young on 12 February, the food including crane-flies (Tipulidae). Two young fledged by 15 February, so nesting began in the previous very wet January. We collected the nest on 18 February and later analysed its structure.

Possibly the same pair escorted two newly fledged young to our feeders on 9 July 2001 (nesting in June after substantial April-May rains); these young fed alone at feeders by 20 July and were seen into early August. A male and female escorted two recently fledged juveniles to the feeders on 19 January 2002; this nesting occurred after unusually heavy October-November rains, during December and into dry January. In this tri-seasonal rainfall area of Kenya (Region D, in part, of Brown & Britton 1980), rains are usually substantial in April-May, less heavy but more regular in July-August, and generally less intense in October-November. Our records suggest that this sunbird may breed following any significant rainfall and at least twice a year in favourable years.

The nest was located in a small open area amid dense secondary woodland 12 m from our vegetable garden fence and 3 m from a path, but not readily visible from it. The nest was in a gangling, thin-branched *Mystroxydon aethiopicum* (Celastraceae) tree 7 m tall, near the end of a drooping 2 mm thick branchlet. Six leaves of this tree were bound into the base of the nest. The nest was 1.5 m above ground, hanging in the open with no vegetation within 1.5 m of it on all sides. Its dimensions were: total

height from attachment to the tip of long, hanging reeds and banana fibres, 67.5 cm; height of basic nest to start of hanging "beard", 27 cm; outside diameter across roof over entrance, 14 cm, and nest diameter at entrance hole, 11.5 cm; diameter of tightly woven inner nest 7.5 cm; and entrance diameter 3.5 cm wide and 4.5 cm high. The structure itself was in four quite discrete parts: (i) the outer nest comprised of coarse, hanging material (bark fibres, including banana; stripped reed leaves), mainly < 20 cm, but some were 35-50 cm long and < 18 mm wide; (ii) firmly attached to this and mainly forming the back of the nest, was a more tightly bound structure of coarse grasses, vine stems, banana bark fibres, dry reeds to < 1 cm wide, and three fine black cotton threads (garden netting) < 28 cm long; (iii) a tightly bound grass and fibre roof piece was well-bound to the top of the first part, to the second part at its rear, and to the inner nest below; (iv) the inner nest was a tightly bound, neat structure of very fine plant fibres and down (pappus), well woven, and attached to the roof and the outer nest. Other than the cotton threads, the building materials within and between elements of the four structures were spirally curled longer or shorter pieces of garden squash *Cucurbita* sp. and of the cucurbit *Zehneria scabra*. These multi-coiled tendrils, twisted through and about the various nest components, held their shape well when dried.

We found no cobwebs in the nest. Jackson, in Jackson & Sclater (1938:1356), noted that this sunbird weaves its nest "without the aid of either cobwebs, cocoon silk or vegetable lint". Spider webbing was not mentioned for this species' nests by Mackworth-Præd & Grant (1960) or Fry *et al.* (2000), nor in nests of the closely allied *C. bannermani* (Fry *et al.* 2000, Cheke *et al.* 2001). Cheke *et al.* (2001:214) erred by writing "with" instead of "without" in stating that *C. verticalis viridiplendens* has its nest "woven with cobwebs, cocoon silk or vegetable lint" (R.A. Cheke, *in litt.*).

The immature plumage changes rapidly after fledging, probably accounting for variation in immature males illustrated by Zimmerman *et al.* (1996), Cheke *et al.* (2001) and Stevenson & Fanshawe (2001). Newly fledged juveniles of both sexes have a creamy-yellow gape and a grey-black throat (best shown by Cheke *et al.* 2001, plate 21). Within two weeks the gape pales to cream-coloured and the yellow breast patch becomes olive-yellow, much like the belly. In this period the throat may become blacker in young males but we have had difficulty sexing immatures up to three weeks after fledging, by which time they visit the feeders unaccompanied by a parent. At c. 6 weeks post-fledging the adult head pattern begins to appear and the sexes then can be distinguished.

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***Buteo polyosoma* and *Buteo poecilochrous* are two distinct species**

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The Red-backed Hawk *Buteo polyosoma* Quoy and Gaimard 1824 occurs from southwest Colombia south to the southern Andes, together with the Pampa region of Argentina, Patagonia, Tierra del Fuego and the Falkland and Juan Fernandez Islands. Southern birds migrate to the lowlands of northern and central Argentina, eastern Bolivia, Uruguay, Paraguay, the Mato Grosso and southern Brazil in winter (Schubart *et al.* 1965, Contreras *et al.* 1990, Fjeldså & Krabbe 1990, Cabot & Serrano 1988). Cabot (1988, 1991) reported the occurrence of wintering individuals in the Bolivian Altiplano. It occurs from sea-level to 4,500 m.

The Puna Hawk *Buteo poecilochrous* Gurney 1879 inhabits rocky regions and cliffs in rugged paramo and puna terrain, rocky Andean ridges and Altiplano from Colombia to northern Argentina and Chile. It is sedentary and occurs between 3,000 and 5,500 m (Lehmann 1945, Dorst 1954, Solís & Black 1985, Fjeldså & Krabbe 1990, Cabot 1988).